

L 40152-66 EWT(d)/FBD/FSS-2/EWT(1)/EWT(m)/EWP(w)/EEC(k)-2/T-2/EWP(k)/EWP(v) IJP(c)

ACC NR. AP6025596 EM/BC/JT/AST/JD SOURCE CODE: UR/0413/66/000/013/0036/0036

INVENTOR: Ageyev, Zh. S.; Mitroshin, E. I.; Podol'nyy, O. A.; Ukolov, I. S.

ORG: Moscow Order of Lenin Aviation Institute im. Sergo Ordzhonikidze (Moskovskiy ordena Lenina aviatsionnyy institut)

TITIE: A method for automatic spacecraft control. Class 21, No. 183257

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 13, 1966, 36

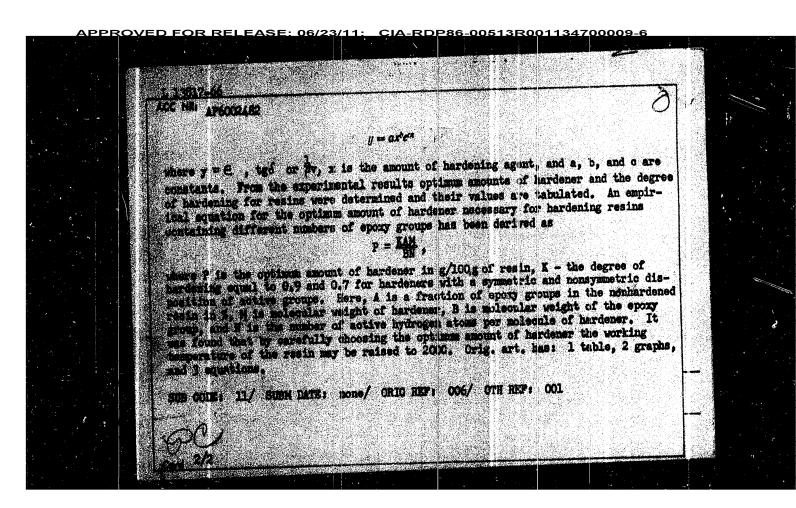
TOPIC TAGS: spacecraft control, spacecraft

ABSTRACT: The method for automatic spacecraft control employs overload sensors, gyroscopic sensors, and control units. To achieve optimum aerodynamic performance with changes of parameters and flight conditions, the longitudinal and transverse overload components are measured. The angles between the resultant overload vector and longitudinal axis of the device and between the reference direction and longitudinal axis of the device are determined. The sum of these two angles is kept [IV] to a minimum by the control circuits.

SUB CODE: 22/ SUBM DATE: 15Apr65/ ATD PRESS: 5049

Card 1/1/7/2

UDC: 531.55.019:621.3.078



Light-66 Der(s)/Dep(1)/T Me/Re

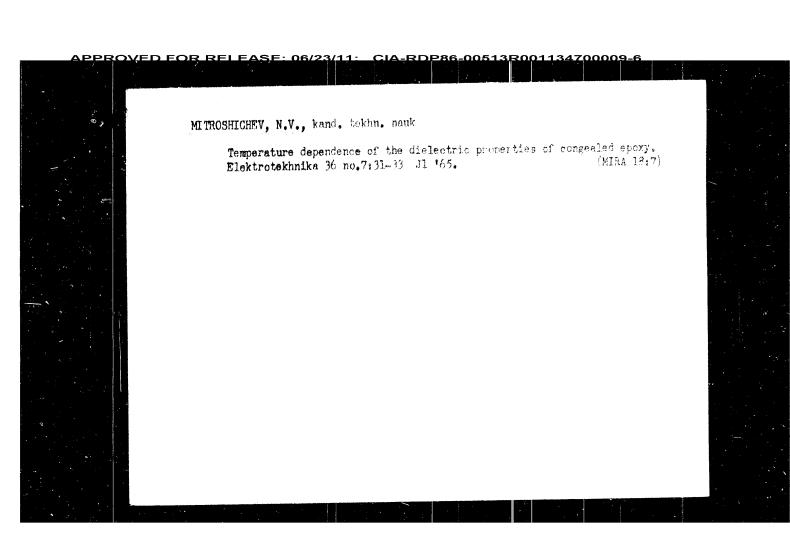
ACC No. 19600262 (A) SOURCE CODE: UR/OL91/66/000/001/0044/0046

AUTHOR: Mitrobiology A. T.

ORG: Dependence of dielectric properties of spoor resize on the degree of bardening caused by aromatic andres

100003: Firsticheskiys baser, no. 1, 1966, 44-46

100003: Fir



88911 \$/143/60/000/004/003/007 A163/A026

Pressing Powderson the Basis of Epoxide Resins

250 h at a relative humidity of 95 - 98% and a temperature of 20°C. Capacitors molded in the K211-34 powder were also tested. The capacitors molded in PEM-TT powder withstood all tests, and a considerable number of those molded in K211-34 powder did not. In addition to capacitor molding, the PEM-TT pressing powder may also be used in the production of various electrical and radiotechnical products. There are 5 tables and 9 Soviet references.

ASSOCIATION: Vsesoyuznyy zaochnyy energeticheskiy institut (All-Union Power En-

gineering Correspondence Institute)

PRESENTED: by the Department for Electroinsulation and Cable Engineering

Card 3/3

88911

8/143/60/000/004/003/007 A163/A026

Pressing Powders on the Basis of Epoxide Resins

the resin mixed until the solidifier is completely dissolved and the ceresin (or stearin) evenly distributed in the compound. Later, a filler - having a temperature of the surrounding medium - is poured into and is carefully mixed with the resin for 2 - 3 min. The liquid mass is then poured from the mixer into cardboard or metal containers (in 1 to 1.5-cm thick layers) and left at room temperature in the open air for 20 - 24 h. Upon completion of the partial polymerization process, the solidified, dark-grey thermoplastic substance is removed from the containers and crushed and ground in the "Perpleks" mill. The ground powder is then passed through screens with 1.6 to 1.8 mm mesh and is ready to be processed into various products by pressing or by pressure casting. When subjecting it to compression pressing, the temperature is 150 - 170°C, the specific pressure 200 - 300 kg/cm², and the time of the pressed powder in the mold is 1 - 1.5min per 1 mm of product thickness. The main physicomechanical and electroinsulating properties of the PEM-TT pressing powder are compared with those of the K211-34 (K211-34) powder. The PEM-TT powder was also used for molding mica capacitors which were subjected to: damping for 500 h at a relative humidity of 95 - 98% and a tropical temperature of 40°C; prolonged heating at 200°C and subsequent damping for 250 h at a relative humidity of 95 - 98% and a temperature of 20°C; and temperature cycles (-60°C, +150°C) with subsequent damping for

Card 2/3

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Mitroshichev, N.V., Engineer

AUTHOR:

Pressing Powders on the Basis of Epoxide Restins

PERIODICAL: Energetika, 1960, No. 4, pp. 53 - 63

TEXT: The article deals with pressing powders made from epoxide resins. The author describes in detail chemical composition, production process, technology of pressing and the properties of the new $\Pi \ni M-TT$ (PEM-TT) pressing powder. The Soviet chemical industry has produced liquid and solid epoxide resins, of which the following are the most important: $\ni II-5$ (ED-5), $\ni II-6$ (ED-6), $\ni -37$ (E-37), $\ni -40$ (E-40), $\ni -41$ (E-41) and $\ni -44$ (E-44). In recent years, a method has been developed for obtaining pressing powder on the basis of liquid epoxide resins. Metaphenylenediamine was used as solidifier. The chemical composition of the pressing powder is as follows: epoxide resin 33.7%, metaphenylenediamine 3.4 - 5%, ground mica 31.2%, ground fluorspar 31.2% and deresin or stearin 0.5%. When starting the production of the PEM-TT powder - based partly on liquid epoxide resin and partly on ED-6 resin - the resin is first heated with ceresin (or stearin) up to a temperature of 110 - 1200C. Then the solidifier is added and

Card 1/3

s/143/62/000/008/001/004 1011/1242

Investigation of

Addition of fillers lowers the cost and increases the heating stability and the heat conduction of the plastic. Mica and mica with fluorspar fillers yield at 300°C while resin with TiO2 or 350°C. There are 5 figures. Al_2O_3 at

ASSOCIATION: Vsesoyuznyy zaochnyy energeticheskiy institut (411-Union Intermural Energetics Institute)

by the Chair of Electrical Insulation and Cables PRESENTED:

Technology

June 10, 1962 SUBMITTED:

Card 3/3

S/143/62/000/008/001/004 1011/1242

Investigation of ...

hardened by a stochiometric amount (8.2%) of the same hardener and contained 35 to 80% of fillers such as T-150, TiO₂, Al₂O₃, ground mica, ground fluorspar and a 1:1 composition of mica and fluorspar. All the specimens were pressed and aged for 500 hrs at 200°C. E and tg6 were measured at f = 10³ cps. Minimum values of E and tg6 and the maximum value of P, were attained at higher temperatures (150°C, 200°C) with the stochiometric amount of hardener. The degree of polymerization increased with increasing amount of hardener up to the stochiometric amount. E decreased while tg6 and P, remained practically constant with an increase in temperature up to 150-180°C for different amounts of hardener. Between 180 and 210°C tg 6 and E increase and P, decreases. E and tg6 increase and P, decreases with an increase in % filler. The most stable filler systems are those with fluorspar and T-150.

Card 2/3

15.8500

h1859 **s/143/6**2/000/008/001/004 I011/I242

AUTHOR:

Mitroshichev, N.V., Engineer

TITLE:

Investigation of electrically insulating materials on the basis of epoxide resins at higher tempera-

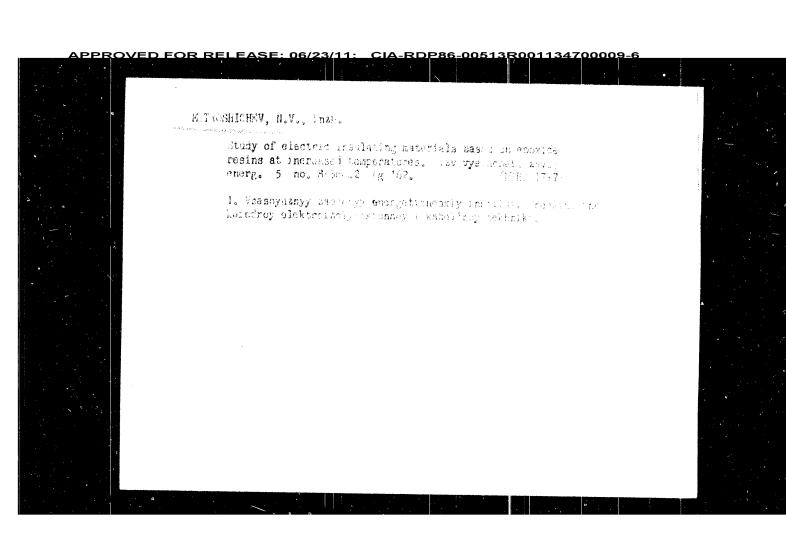
tures

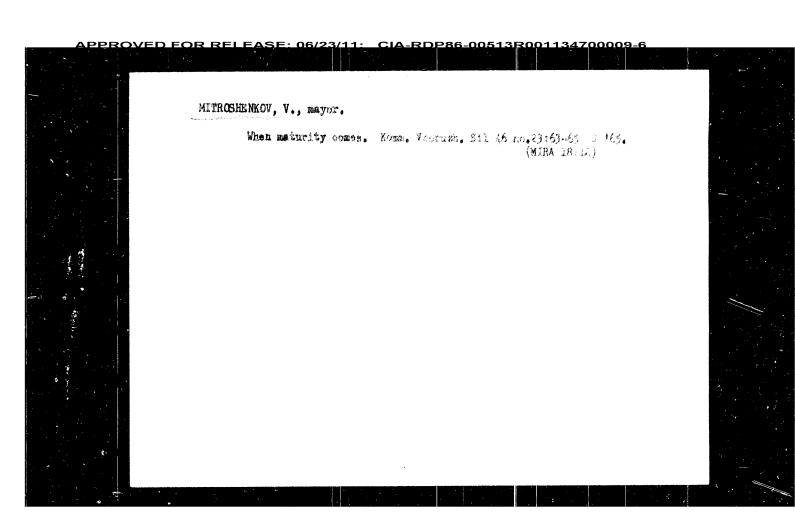
PERIODICAL:

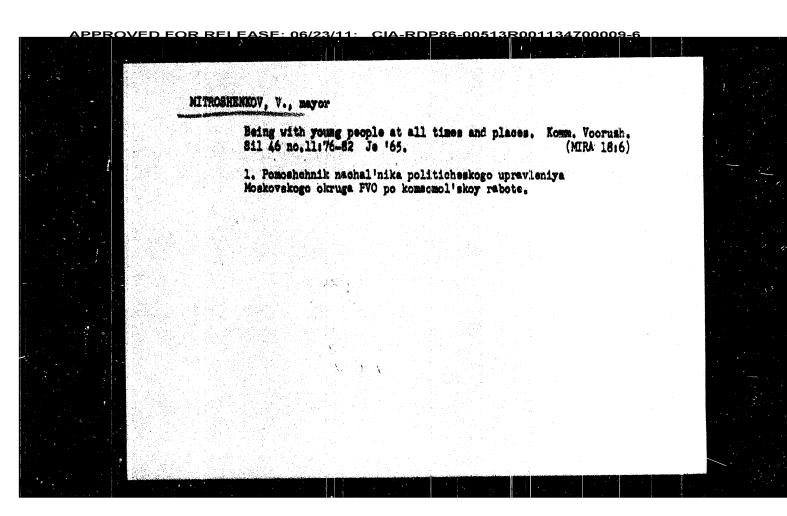
Energetika, no. 8, 1962, 36-42

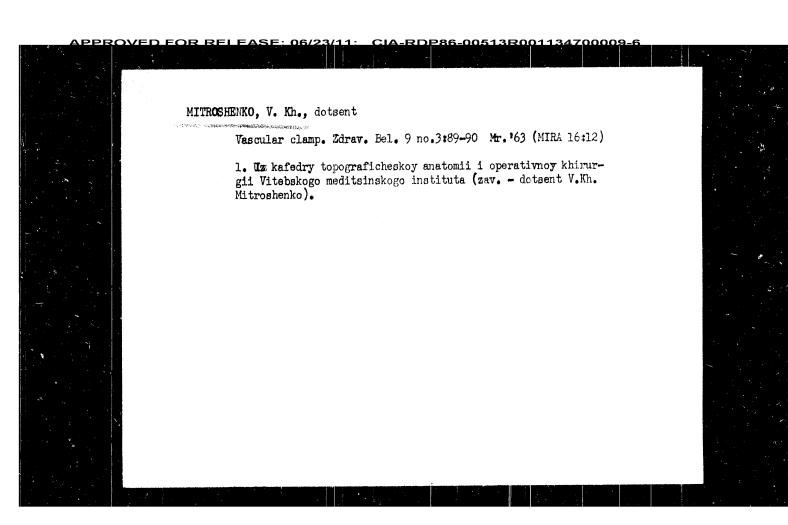
TEXT: The delectric constant &, the loss angle tg (, and the volume resistivity & were investigated as functions of temperature for the pure epoxide resin 3A.-6 (ED-6) hardened by different amounts of hardener and at different temperatures. Some of the resin specimens were partially hardened by 7.0, 8.2, 9.2, 9.7, 10.3, and 12.2% of metaphemilendiamin; others were

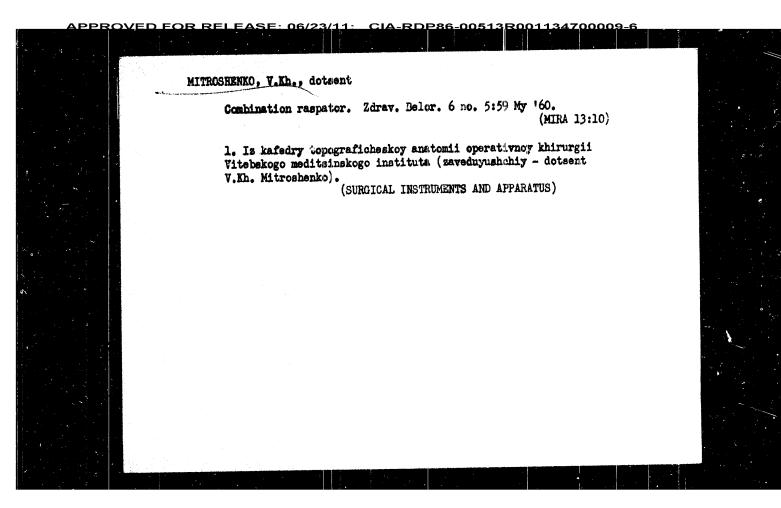
card 1/3











USOR / Human and Animal Murphology (Normal and Pathological).

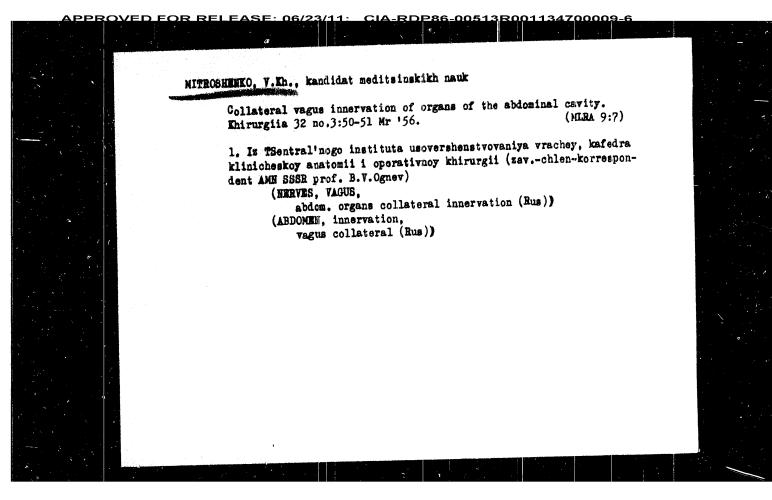
Nervous System. Feripheral Norvous System.

Abs Jour : Ref Zhur - Biologiya, No 9, 1958, No. 40794

aorta in the thoracic area are situated under the lower border of the aortic arch or at its level.

Card 2/2

USSR / Human and Animal Morphology (Normal and Pathological). Nervous System. Peripheral Nervous System. ! Ref Zhur - Fiologiya, No 9, 1958, No. 40794 Abs Jour : Mitrosbenko, V. Kh. Author Vitebsk Modical Institute : On the Acrtic Branches of the Vagus Nerve in Man Inst Title : Sh. nauchn. rabot. Vitebakiy med. in-t, 1957, vyp 8, Orig Pub 75-7 : It was demonstrated on 250 cadavers (135 men and 115 women) in the ages of 10 - 90 that regardless of sex Abstract and age, fibers of the vagus nerve (VN) take part in the composition of the plexus of the thoracic acrta. They enter into the plexus of the thoracic aorta from the cardiac plexus and directly from the VN. The branches coming directly from the VN originate at various levels. The greatest number of branches of the VN going to the Card 1/2



MITHOSHENKO, V. Kh.

Dissertation: "On Morphology of the Breast Section of Vegus in Human."

17/10/50
Central Inst. for Advancement of Physicians.

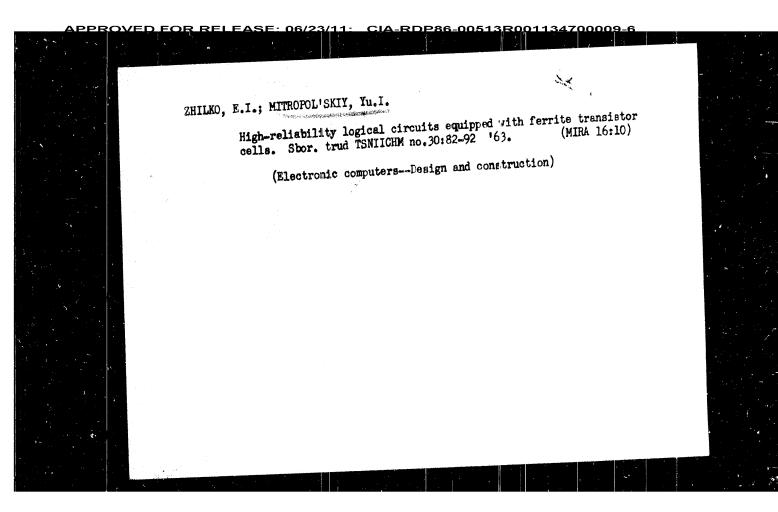
SO Vecheryaya Moskva
Sum 71

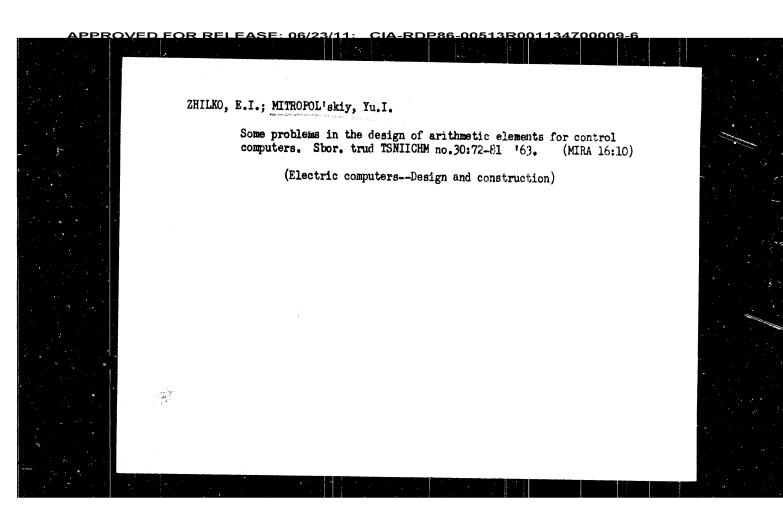
MITROSHENKO, V. Kh.

"On the morphology of the chest section of the vagus herve in man", Shornik tricov.

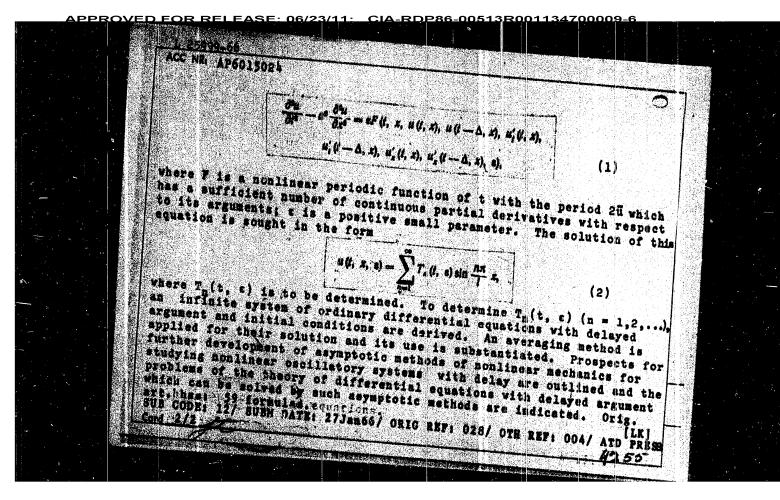
posvyashuh. prof. Savinykh, Tomek, 1948, p. 161-63

So: U-3 61, 10 April 1953, (Letopis 'zhurnal 'nykh Statey, No. 12, 1949).



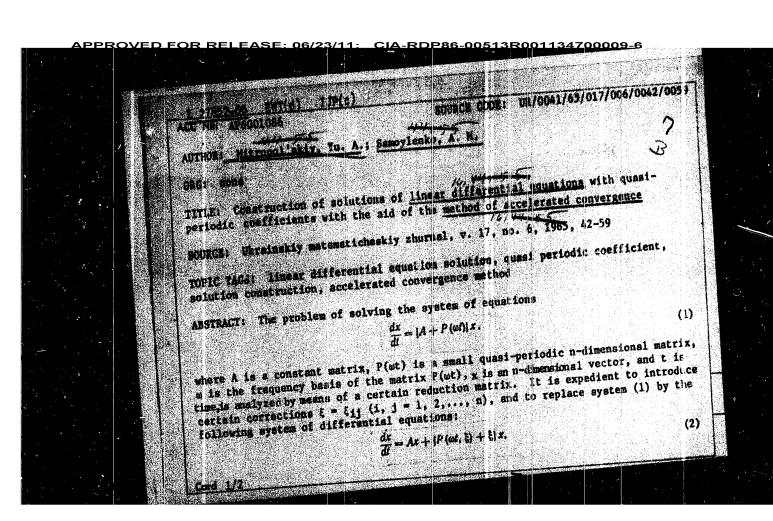


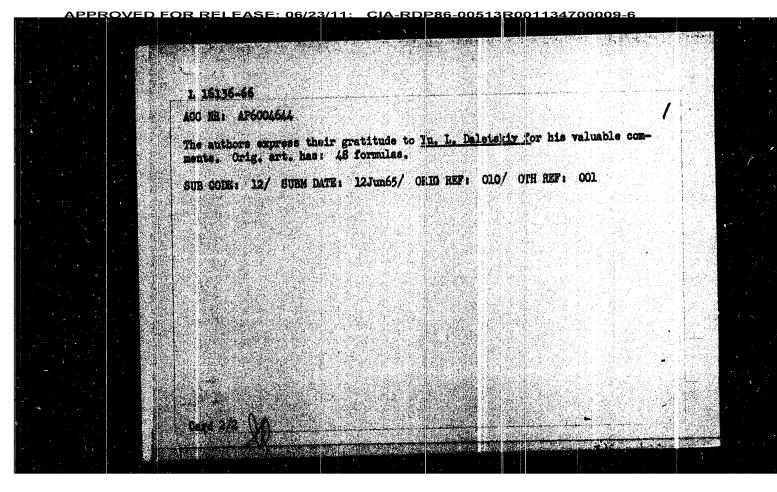
GALYATIN, V.M.; KALINSKIY, D.N.; Prinimali uchastiye: KUROCHKIN, I.F.; DUVANOV, A.I.; SOLOV'YEV, Yu.F.; GERASIMOV, Yu.V.; GROSVAL'D, V.G.; SHASHKOV, W.N.; VOLKOV, A.A.; ZHILKO, E.I.; MITROPOL'SKIY, Yu.I.; FEDOSEYEV, S.V.; GONCHAROV, F.I.; rabotnik; SHEMETOV, P.Ye., rabotnik; CHUPRINA, I.A., rabotnik; DEMIN, P.Ye., rabotnik; GONCHARENKO, P.V., rabotnik; SIMANYHK, G.N., rabotnik; GONCHARENKO, P.V., rabotnik; SIMANYUK, G.N., rabotnik Investigating power and technological parameters of rolling on the 2350 medium sheet mill. [Sbor. trud.] TSNIICHM no.29:138-148 1. Sotrudniki TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii (for Gerasimov, Grosval'd, Shashkov, Volkov, Zhilko, Mitropol'skiy, Fedoseyev). 2. Listoprokatnyy tsekh Magnitogorskogo metallurgicheskogo kombinata (for Goncharov, Ghanatan Dawie Chanatan Canadan Magnitogorskogo metallurgicheskogo kombinata (for Goncharov, Shemetov, Demin, Chuprina, Goncharenko, Simanyuk).



<u> APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700009-6</u> in (a) hap (a) / sup (a) . I.D. a) UR/0041/66/018/003/0065/0984 BOURGE CODE: Yu. A. (Elev); Rodobut, V. I. (Klev) ORIGI "Asymptotic methods of nonlinear mechanics as applied to nonthear differential equations with a delayed orgunent BOURCE: Utrainskly matematicheskly shurnal, v. 18, no. 3, 1966, 65-84 oscillation theory, nonlinear oscillation , nonlinear TOPIC TAORE mechanics, sayaptotic method, averaging method, delay system ABSTRACT: Oscillatory processes in systems with after effect which are ordinarily described by differential equations with a delayed argument are studied on the basis of the asymptotic methods of nonlinear mechanics and an averaging method. The basic results obtained in developing methods for constructing asymptotic expansions for various types of quasi-linear differential equations with delayed argument and the basic results in substantiating developed methods are reviewed. An original contribution of the article is a study of an escillatory system with distributed parameters and with time delay described by a quasi-linear partial differential equation with a delayed argument of the form Card 11/2

KCE INC. APROXIDES where A is a mateix of a linear system of differential equations with constant coefficients, P(\$, £) (\$ = wt) is a periodic matrix with respect to \$ having a period of 2m and analytic with respect to * and & in cartain given domains. The problem studied in the exticle is formulated as follows: to find an analytic trans $x = \Phi(\phi)y$ formation where o(a) is a periodic matrix with respect to a having a period of 2π, and [* [(*) such that system (2) is reduced to a linear system (4) $\frac{dy}{dt} = Ay$ with constant coefficients whose general solution can be easily obtained. To construct the reduction matrix $\phi(\phi)$, the iterative method ensuring the "accelerated" convergence of the process (of Newton's type) developed and successfully applied in studies by W. A. Kolmogorov, V. I. Arnol'd, and N. N. Bogolyubov is utilized. The s-th(s 2 1) step of the iterative process is described and a theorem is proved establishing the characteristics of the transition from the (s-1)-th to the s-th iteration. The upper bound for the absolute value of the formation $P(\phi,\xi)$ is derived in terms of certain constants characterizing the 6 - 1)-th and s-th iterations. On the basis of the theorem proved here, an iterative convergent process is constructed which satablishes the reduction matrix ((*)). The form of the solution of system (1) is also established. Orig. art. basis 149 formules. SUBM DATE: 225ep63/ OREG BEE: 012/ ATD PRESS: 4/69





L 1614-66 EP(4) LUP(e)

ACC Mr. Arconsid.

ADTRONS: Ritrypol'skiy, Yu. A. (Kiev): Lykova, O. B. (Kiev)

ORG: none

(A. 44, 5

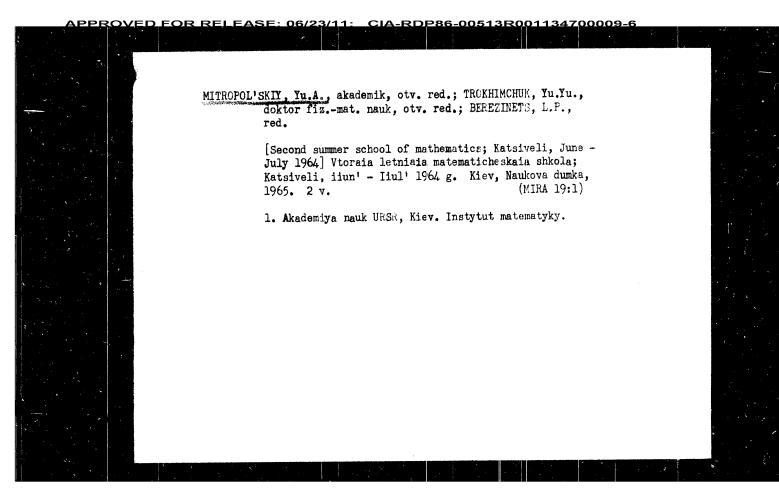
TITLE: Integral manifold of a nonlinear system in Hilbert space

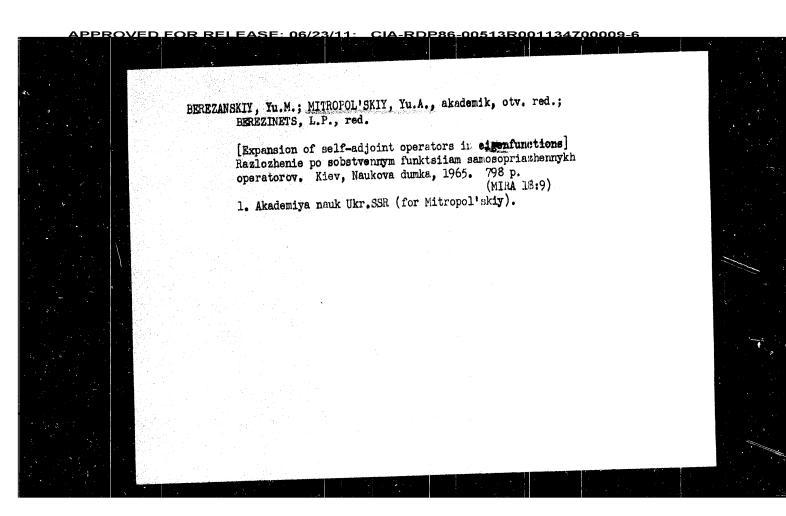
SOURCE: Ukrainskiy matematicheskiy shurnal, v. 17, no. 5, 1965, 43-53

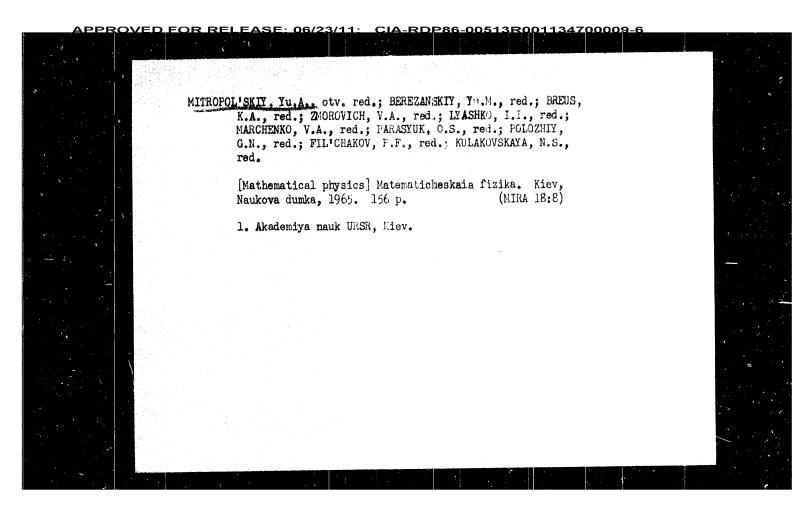
TOPIO TAGS: differential equation, stability

ABSTRACT: The authors irent dr. (A. 4, 1, 1, 1, 1, 1, 2) are vector functions with values in Hilbert space i., in a neighborhood of the equilibrium position of dr. (the corresponding upperturbed squation). Conditions are given under which (1) spaces conditions sufficient for asymptotic stability of S are presented.

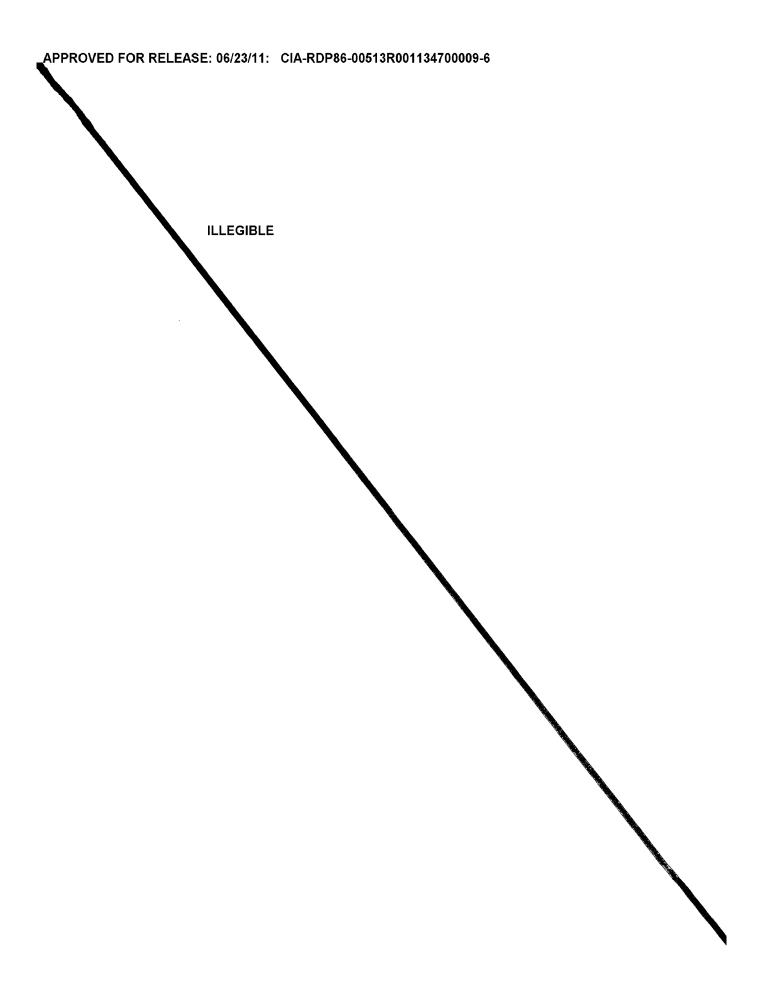
Gard 1/2











ACCESSION NR: AP4026832

where x, Y₁, y, Y₁ and z, Z₁ are respectively \(\) -, m- and n-vectors, X is an \(\) x \(\) matrix, Y is an m x m matrix, \(\) is a small positive parameter. Several restrictions are placed on this system, including assumptions of decay, and it metric representation has a specific given form. On the manifold S whose parasystem of equations is equivalent to s+l equations which are given. Any solution of system (1) not lying on the manifold S, whose initial values lie near S, is attracted to the manifold at an exponential rate at the least. Orig. art. has:

ASSOCIATION: none

SUBMITTED: 26Feb63

DATE ACQ: 16Apr64

MNCL: 00

SUB CODE: MM

NO REF SOV: OOL

OTHER: 003

Card 2/2

ACCESSION NR: AP4026832

AUTHORS: Mitropol'skiy, Yu. A. (Kiev); Ly*kova, O. B. (Kiev)

TITLE: Integral manifold of nonlinear differential equations containing slow and fast motions

SOURCE: Ukrainskiy matematicheskiy zhurnal, v. 16, no. 2, 1964, 157-163

TOPIC TAGS: integral manifold, nonlinear differential equation, slow motion, fast solution, decay assumption, characteristic exponent, parametric family, periodic exponential rate

ABSTRACT: The authors study the following system of 1 + m + n equations $\frac{dx}{dt} = X(y,z)x + sX_1(t,x,y,z), \qquad (1)$ $\frac{dz}{dt} = aZ_1(t,x,y,z), \qquad (1)$

L 2002-65

EWT(d)/FSF(h)

IJP(c)/AEDC(a)

ACCESSION NR: AP4048315

\$/0021/64/000/008/0984/0986

Mitropol'skiy, Yu. A.); Samoylenko, Structure of trajectories on toroidal manifolds

SOURCE: AN UKERSR. Dopovidi, no. 8, 1964, 984-986

TOPIC TAGS: trajectory structure, torus, toroidal manifold, differentiable

ABSTRACT: The results of V. I. Arnol'd (Izd-vo AN SSSR, ser. matem. v. 25, no. 21, 1961) and N. N. Bogolyubov (Tr. 1-y letney matematicheskoy shkoly*, izd-vo "Nauka", no. 17, 1964) relative to the structure of trajectories on a torus are extended to the case in which the functions defining the torus are only differ-

ASSOCIATION: Insty*tut matematy*ky* AN URSR (Mathematics Institute, AN

SUBMITTED: 31Mar64

ENCL: 00

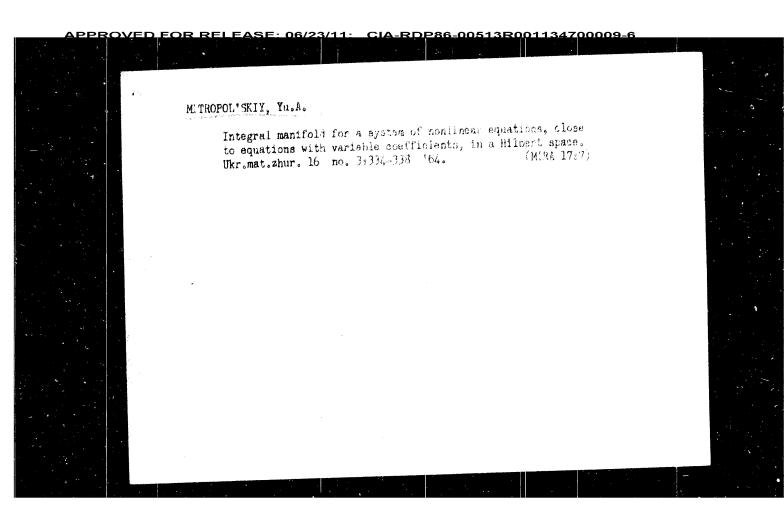
NO REF SOV: 007

OTHER: OO1

SUB CODE:

JPRS

Card 1/1



AM4037985 Foreword by Academician N. N. Bogolyubov -- 6 Ch. I. Examples of differential equations encountered in the study of nonlinear oscillation systems with a slowly changing parameter -- 11 Ch. II. "Natural" oscillations in nonlinear systems with allowly changing parameters -- 30 Ch. III. The effect of "periodic" forces on nonlinear oscillation systems with Ch. IV. Single-frequency oscillations in nonlinear systems with many degrees of freedom and slowly enarging parameters -- 100

Ch. V. Nonlinear oscillation systems with gyroscopic members -- 240

Ch. VI. Single-frequency oscillations in systems with distributed parameters -- 314

Ch. VII. Methods of constructing asymptotic solutions for systems of differential Ch. VIII. Mathematical basis of the asymptotic method -- 380 Bibliography -- 425 SUB CODE: MA, DP OTHER: 029 SUBMITTED: 28Nov63 DATE ACQ: 3CAprol NR REF SOV: 146 Card 2/2

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700009-6

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BOOK EXPLOITATION

3/

Mitropol'skiy, Yuriy Alekseyevich

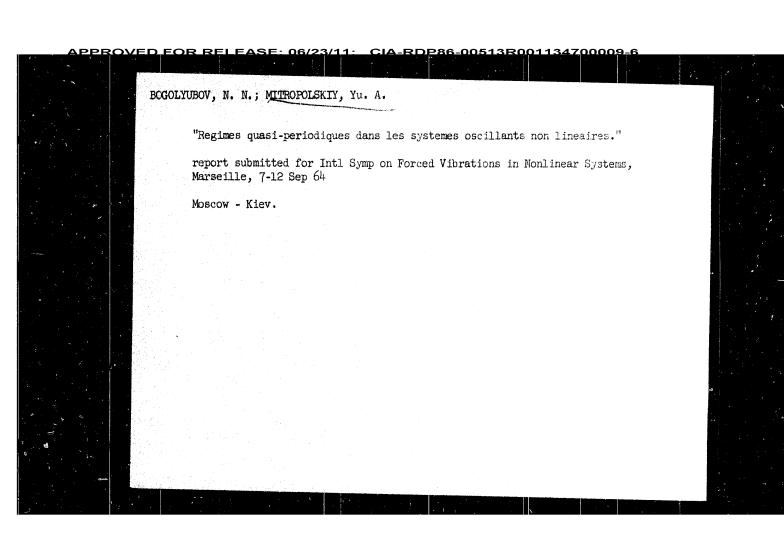
Problems in asymptotic theory of nonstationary oscillations (Problemy* asimptoticheskoy teorii nestatsionarny*kh kolebaniy), Moscow, "Nauka", 1964, 431 p. illus., biblio. 4,300 copies printed.

TOPIC TAGS: physics, mathematics, nonlinear oscillation system, nonstationary oscillation, gyroscope, differential equation, automatic regulation

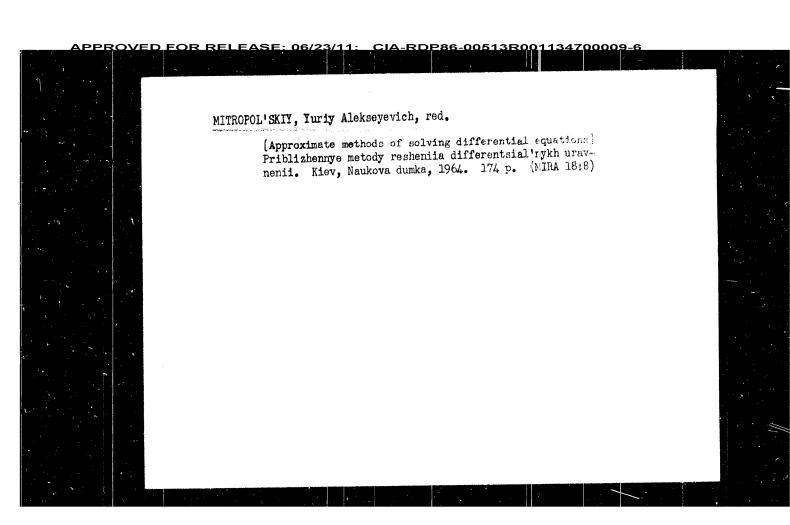
PURPOSE AND COVERAGE: This book is devoted to approximate asymptotic methods of solving problems in the theory of nonstationary oscillation processes. The methods developed by the author are applicable for investigation of a broad class of irregular oscillation processes in nonlinear systems. They permit solution of problems of passing through resonance and study of nonstationary processes in gyroscopic systems, accelerator assemblies, systems of automatic regulation, and other important problems of physics and technology. The book is intended for a broad circle of engineers, technicians, and researchers interested in the various problems of the theory of oscillations and differential equations containing a small parameter.

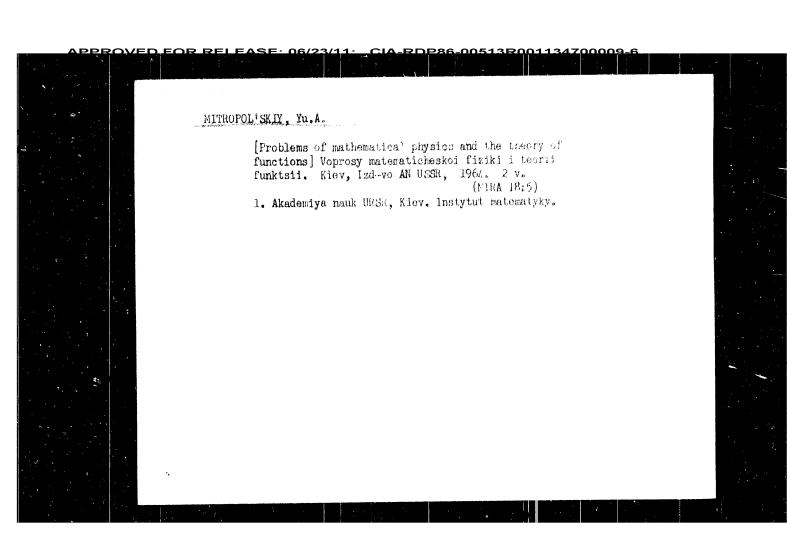
TABLE OF CONTENTS [abridged]:

Card 1/2



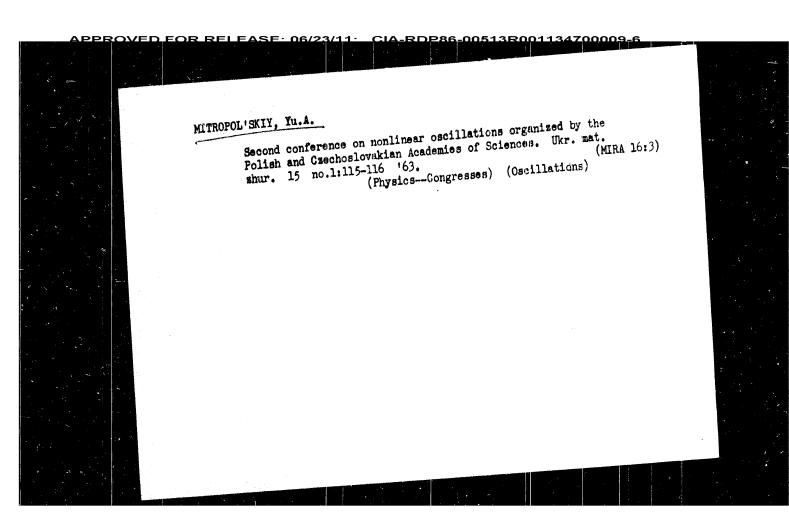
MITROPOLSKIY, Yu. A. (Kiev) "Anwendung asymptotischer Methoden der nichtlinearen Mechanik zur Untersuchung nichtlinearer Schwingungssysteme mit verteilten Parametern." report submitted for 3rd Conf on Nonlinear Oscillations, E. Berlin, 25-30 May 64.





MITROPOL'SKIY, Yu.A. akademik, otv. red.; BOGOLYUBOV, N.N., akademik, glav. red.; LUR'YE, A.I., red.; LYKOVA, O.B., kand. fiz.-matem. nauk, red.; NEMYTSKIY, V.V., prof., red.; PISARENKO, G.S., red.; POCREBYSSKIY, I.B., kand. fiz.-matem.nauk, red.; KORENBLYUM, B.I., doktor fiz.matem.nauk, red.; KOZUBOVSKAYA, I.G., red.; LISOVETS, A.M., tekhn. red. [Proceedings of the International Symposium on Nonlinear Oscillations] Trudy Mezhdunarodnogo simpoziuma po nelineinym kolebaniiam. Kiev, Izd-vo AN USSR. Vol.2. [Qualitative methods in the theory of nonlinear oscillations] Kachestvennye metody teorii nelineinykh kolebanii. 1963. 538 p. [Applications of the methods in the theory of nonlinear oscillations to problems in physics and technology] Prilozheniia metodov teorii nelineinykh kolebanii k zadacham fiziki i tekhniki. 1963. 513 p. (MIRA 17:1) 1. International Supposition of Amlinear Oscillations, Kiev, 1961. 2. Akademiya nauk Ukr.SSR (for Mitropol'skiy). J. Chlen-korrespondent AN SSSR (for Lur'ye). 4. Chlenkorrespondent AN Ukr.SSR (for Pisarenko).

RDP86-00513R001



Asymptotic Methods in (Cont.) SOV/6574 by L. S. Pontryagin and Ye. F. Mishchenko and with results concerning the generalized averaging method obtained by V. M. Volosova. There are 49 references, mostly Soviet. TABLE OF CONTENTS: Foreword to the Third Edition 5 Foreword to the Second Edition 5 Foreword to the First Edition 5 Introduction 7 Ch. I. Natural Oscillations in Almost Linear Systems 1. Construction of asymptotic solutions
2. Conservative almost linear systems
3. The case of nonlinear friction Card 2/6

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134Z00009-6

PHASE I BOOK EXPLOITATION

SOV/6574

Bogolyubov, Nikolay Nikolayevich, and Yuriy Alekseyevich Mitropol'skiy

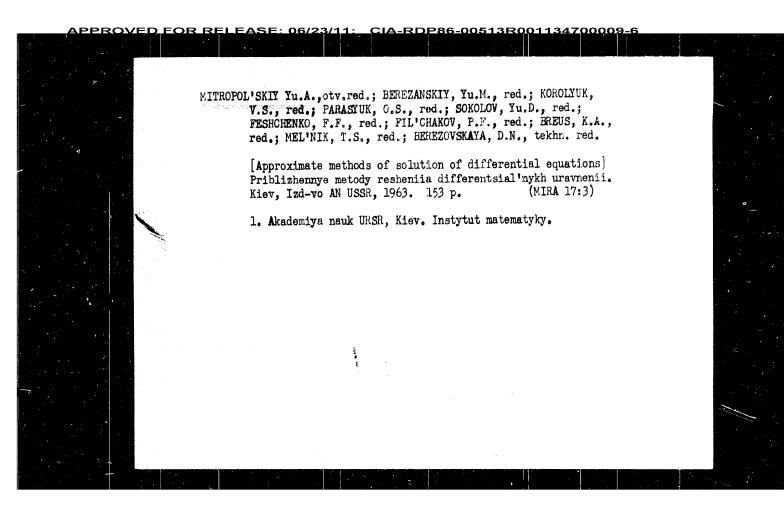
Asimptoticheskiye metody v teorii nelineynykh kolebaniy (Asymptotic Methods in the Theory of Nonlinear Vibrations) 3d ed., rev. and enl. Moscow, Fizmatgiz, 1963. 410 p. 5000 copies printed.

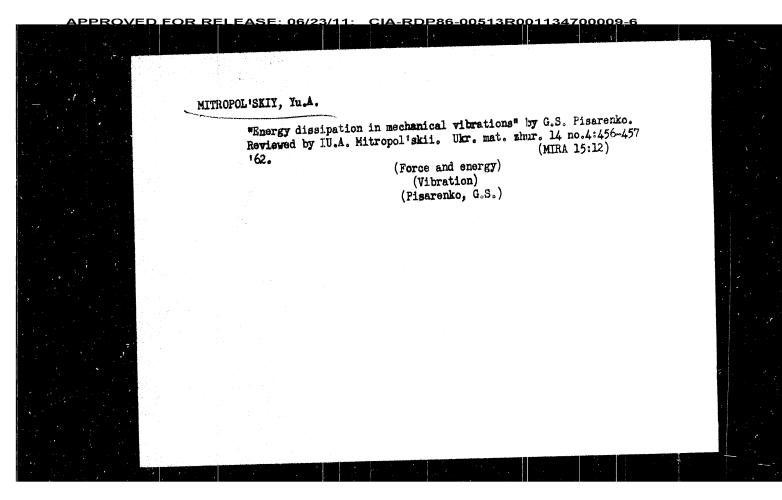
Ed.: Ye. Ye. Zhabotinskiy; Tech. Ed.: L. V. Likhacheva.

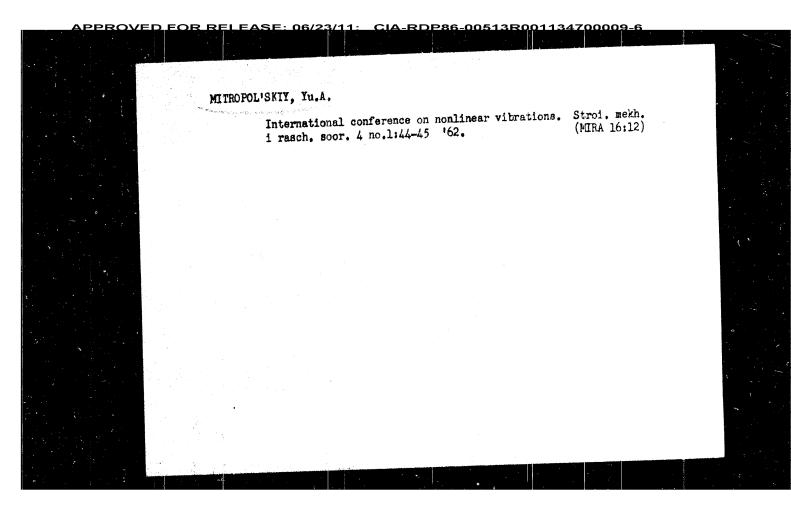
PURPOSE: The book is intended for engineers and scientific workers interested in oscillatory processes.

COVERAGE: The book is revised and extended edition of a well-known book first published in 1955. It deals with approximate asymptotic methods for solving problems in the theory of nonlinear oscillations which arise in physics and engineering. The methods are discussed in a very simple form; special mathematical training is not required for their understanding. This edition is supplemented with results concerning relaxational oscillation obtained

Card 1/6







APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700009-6

Transactions of the All-Union Congress (Cont.)

SOV / 6201

PURPOSE: This book is intended for scientific and engineering personnel who are interested in recent work in theoretical and applied mechanics.

coverage: The articles included in these transactions are arranged by general subject matter under the following heads: general and applied mechanics (5 papers), fluid mechanics (10 papers), and the mechanics of rigid bodies (8 papers). Besides the organizational personnel of the congress, no personalities are mentioned. Six of the papers in the present collection have no references; the remaining 17 contain approximately 1400 references in Russian, Ukrainian, English, German, Czechoslovak, Rumanian, French, Italian, and Dutch.

TABLE OF CONTENTS:

SECTION I. GENERAL AND APPLIED MECHANICS

Artobolevskiy, I. I. Basic Problems of Modern Machine Dynamics

5

Bogolyubov, N. N., and Yu. A. Mitropol'skiy. Analytic Methods of the Theory of Nonlinear Oscillations

25

Card 2/9 2

Mitropol'skiy YU.A.

PHASE I BOOK EXPLOITATION

SOV/6201

Vsesoyuznyy s"yezd po teoreticheskoy i prikladnoy mekhanike. lst, Moscow, 1960.

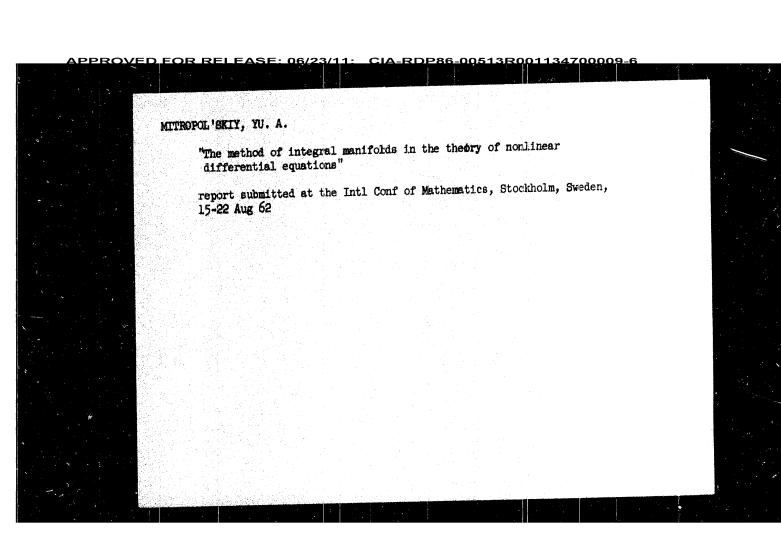
Trudy Vsesoyuznogo s"yezda po teoreticheskoy i prikladnoy mekhanike, 27 yanvarya -- 3 fevralya 1960 g. Obzornyye doklady (Transactions of the All-Union Congress on Theoretical and Applied Mechanics, 27 January to 3 February 1960. Summary Reports). Moscow, Izd-vo AN SSSR, 1962. 467 p. 3000 copies printed.

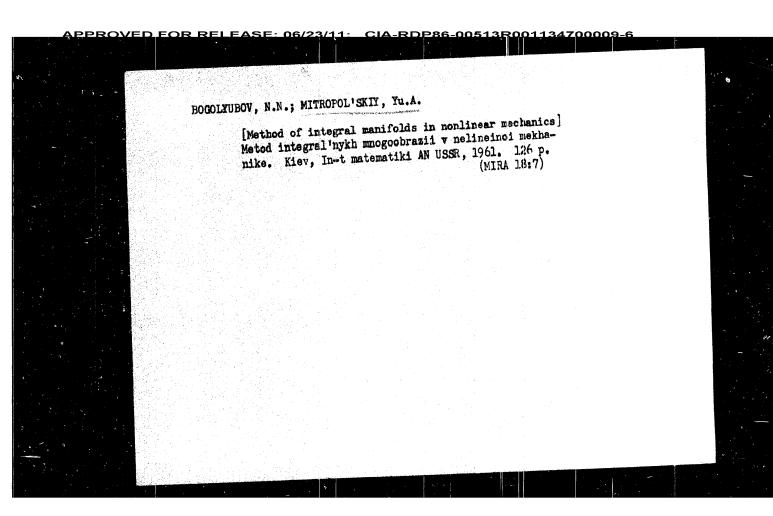
Sponsoring Agency: Akademiya nauk SSSR. Natsional'nyy komitet SSSR poteoreticheskoy i prikladnoy mekhanike.

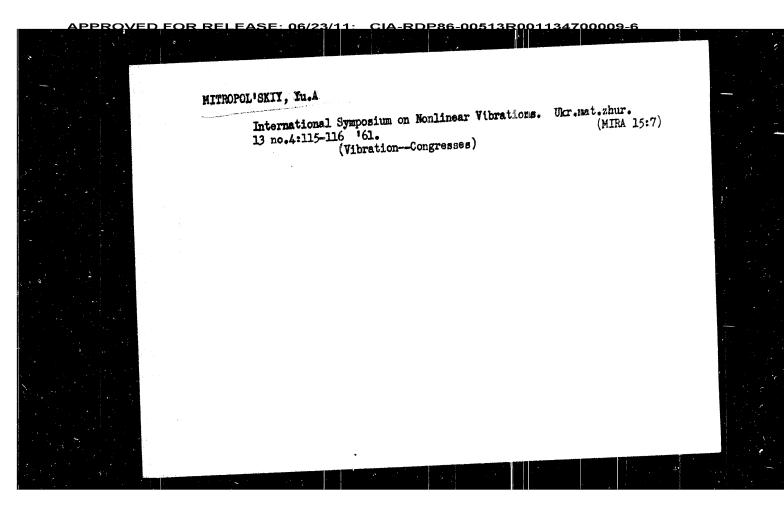
Editorial Board: L. I. Sedov, Chairman; V. V. Sokolovskiy, Deputy Chairman;

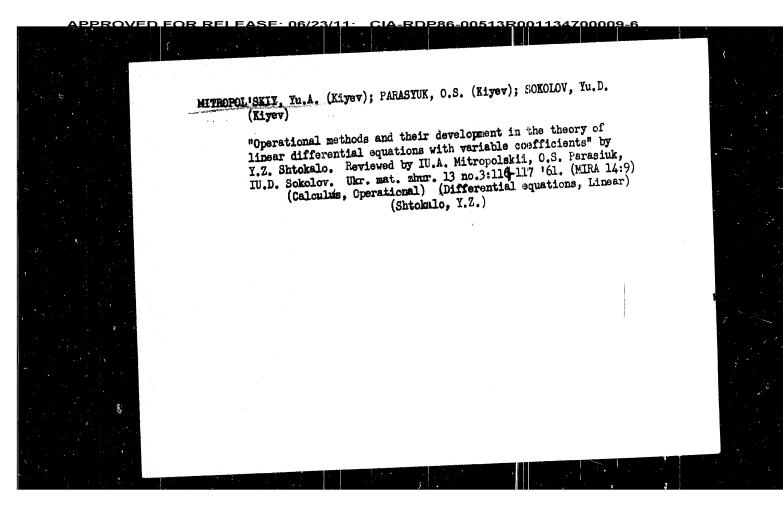
- G. S. Shapiro, Scientific Secretary; G. Yu. Dzhanelidze, S. V. Kalinin,
- L. G. Loytsyanskiy, A. I. Lur'ye, G. K. Mikhaylov, G. I. Petrov, and
- V. V. Rumyantsev; Resp. Ed.: L. I. Sedov; Ed. of Publishing House:
- A. G. Chakhirev; Tech. Ed.: R. A. Zamarayeva.

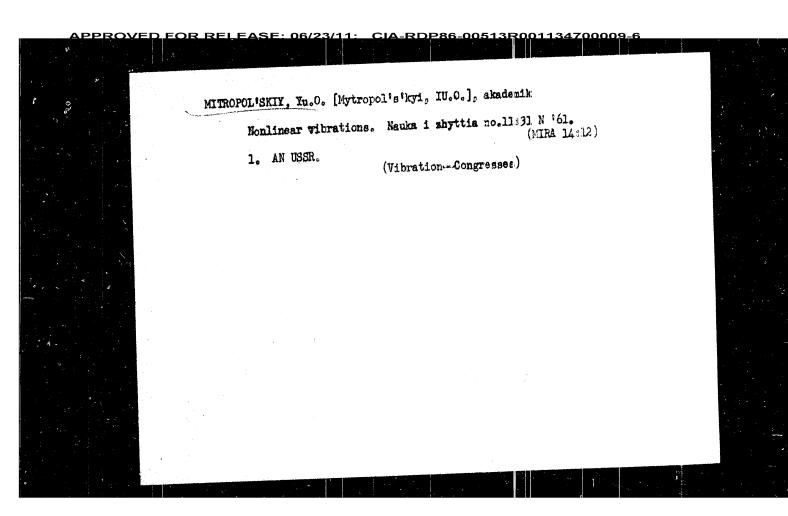
Card 1/6 -

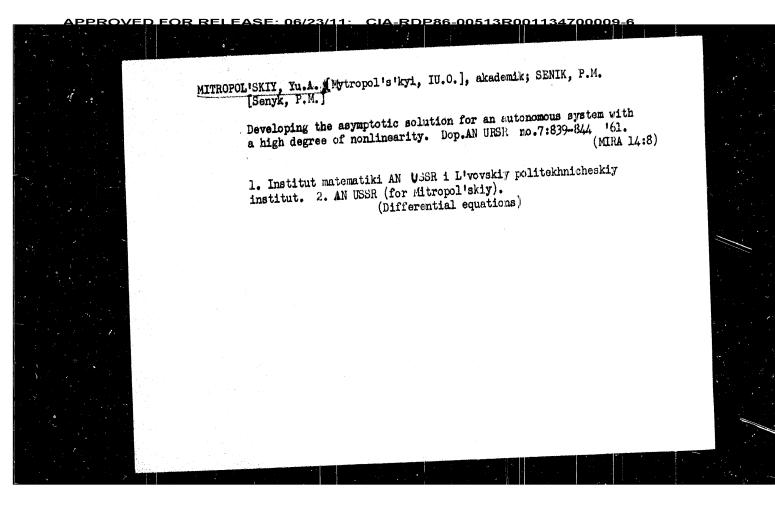


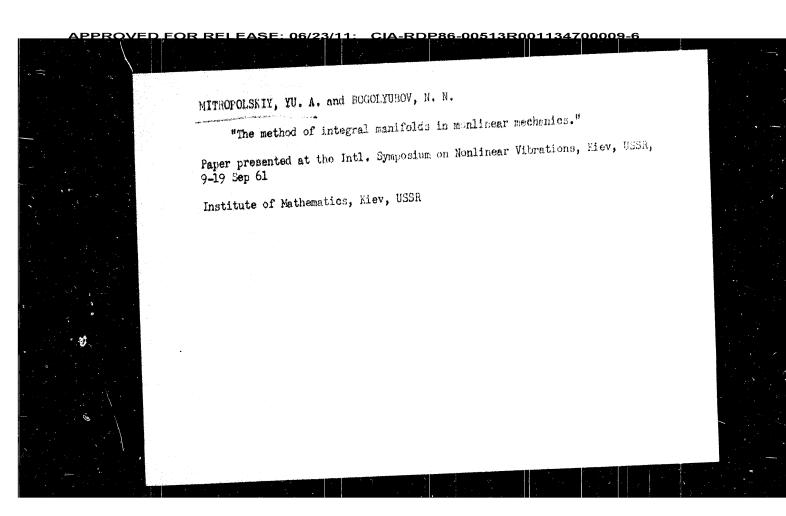


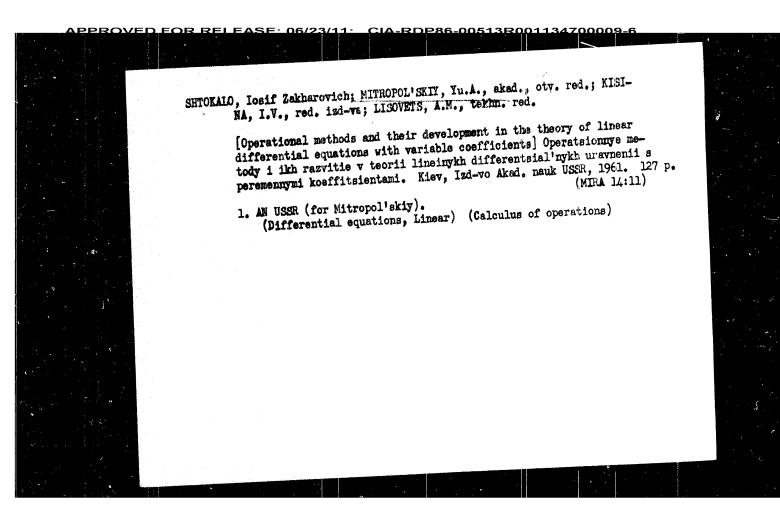


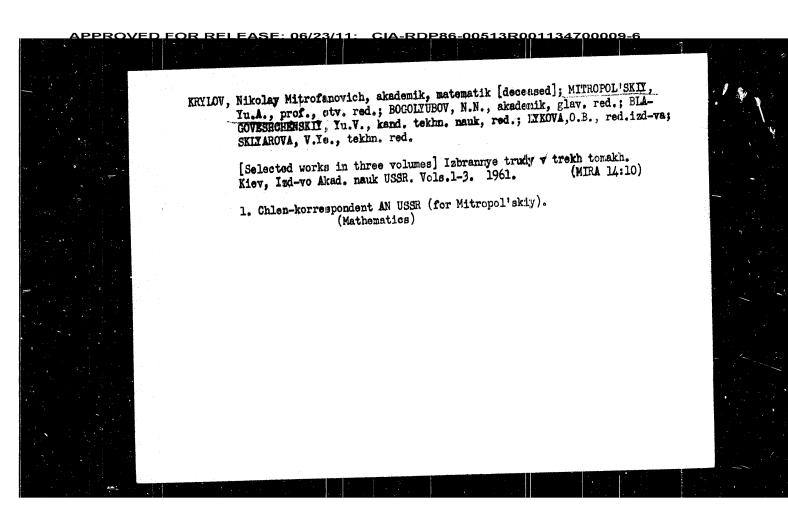


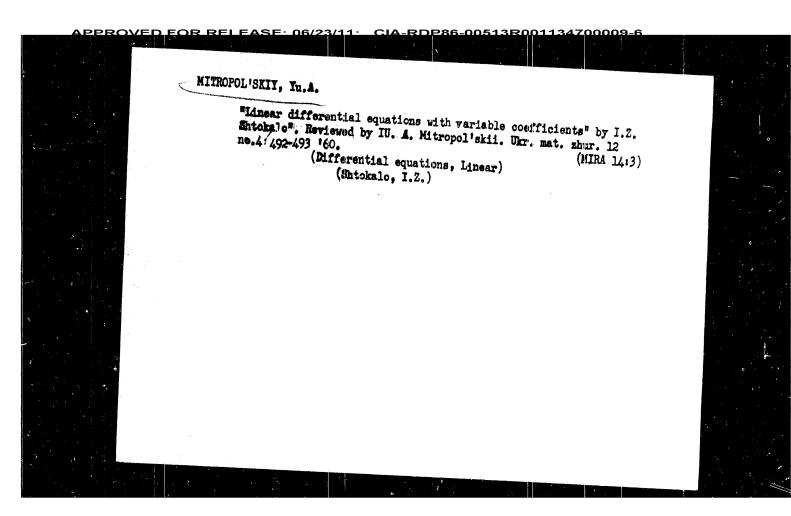












SETOKAIO, I.Z., adademik; MITROPOL'SKIY, Yn.A.; FIL'CHAMOV, P.F., doktor fizmat, nauk

Mikhail Alekseevich Laverent'ev; on his 60th birthday. Ukr. mat. zhur. 12

no.41490-491 '60.

1. AH USSR (for Shtokalo). 2. Chlen-korrespondent AN USSR (for
Mitropol'skiy).

(Lavrent'ev, Mikhail Alekseevich, 1900-)

APPROVED FOR RELEASE: 06/23/11: GIA-RDP86-00513R001134700009-6

88302

\$\frac{3}{41}/60/012/004/003/011}{0111/0222}\$

On the Question on Periodic Solutions of Monlinear Systems of Equations with a Small Parameter

where X, Y are continuous and $2\sqrt{x}$ - periodic in t, the undisturbed system

(38) $\frac{dx}{dt} = X(t,x)$ has an isolated stable $2\sqrt{x}$ -periodic solution

(39) x = x(t),

and in a certain neighborhood of (39) the right sides of (37) satisfy certain conditions of smoothness.

There are 2 Soviet references.

SUBMITTED: May 18, 1960

S/041/60/012/004/003/0 C111/C222

On the Question on Periodic Solutions of Nonlinear Systems of Equations With a Small Parameter

(6) $\Delta_{\mathbf{a}}(\mathbf{x}) = \begin{cases} A_{\mathbf{a}} \left\{1 - \frac{\mathbf{x}^2}{\mathbf{a}^2}\right\}^2 & |\mathbf{x}| \leq \mathbf{a} \end{cases}$ (6) $\Delta_{\mathbf{a}}(\mathbf{x}) = \begin{cases} A_{\mathbf{a}} \left\{1 - \frac{\mathbf{x}^2}{\mathbf{a}^2}\right\}^2 & |\mathbf{x}| \leq \mathbf{a} \end{cases}$ and normed by

(7) $\Delta_{\mathbf{a}}(\mathbf{x}) d\mathbf{x} = 1$.

Besides, the authors estimate the difference $|x(t) - x_1(t)|$, where $x_1(t)$ is the first approximation of the solution of (1'). Similar results are obtained for the more general system

(37)
$$\frac{dx}{dt} = X(t,x) + \varepsilon Y(t,x) ,$$

Card 4/5

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700009-

88302

S/041/60/012/004/003/011 C111/C222

On the Question on Periodic Solutions of Monlinear Systems of Equations With a Small Parameter

where M and η are positive constants. Under the given assumptions it is shown (theorem 1) that in a certain neighborhood of the solution $\mathbf{x}^* = \mathbf{x}_0$ of (2) the system (1') has a unique, asymptotically stable, $2^{\widetilde{\mathbf{x}}}$ - periodic solution $\mathbf{x} = \mathbf{x}(t)$. This solution has the structure $\mathbf{x}(t) = \mathbf{x}^* + \mathrm{Dh}(t) + \varepsilon \mathbf{u}(t,\mathbf{x}^* + \mathrm{Dh}(t))$, where D is the quadratic constant matrix appearing in the general solution $\mathbf{x}^* = \mathbf{x}^* + \mathbf{x}^* = \mathbf{x}^* + \mathbf{x}^$

quadratic constant matrix appearing in the general solution $\delta x^* = D\overline{h}$ of (4); h(t) denotes the periodic solutions of a complicated auxiliary system, and u(t,x) is given by

(9)
$$u(t,x) = \int_{0}^{\Delta} \Delta_{a}(x - x_{1}) \left\{ \int_{0}^{t} [Y(t_{1},x_{1}) - \overline{Y}(x_{1})] dt_{1} \right\} dx_{1}$$

where $\triangle_{R}(x)$ is defined by

Card 3/ 5

\$\frac{5}{302}\$

\$\frac{5}{41}/60/012/004/003/011}\$

On the Question on Periodic Solutions of Nonlinear Systems of Equations with a Small Parameter

among their solutions $x^* = x^*(t)$, for which the characteristic equation (3) $|I_n z - \phi_x^!(x_0^*)| = 0$ corresponding to the system of equations in variations

(4) $\frac{d 6x^*}{dt} = \phi_x^!(x_0^*) \delta_x^*,$ has only roots with a negative real part.

3. There exists a convex neighborhood $U_{90} \in E_n$ of the solution x_0^* in which the $\phi(x)$ have continuous partial derivatives to x up to the second order.

4. For x, x^* , $x^* \in U_{90}$ and all real t it holds $|Y(t,x)| \leq M$ $|Y(t,x') - Y(t,x'')| \leq \gamma |x' - x''|$ Card 2/5

88302 S/041/60/012/004/003/011 C111/C222 16.3400 AUTHORS: Witropol'skiy, Yu.A., and Lykova, O.B. TITLE: On the Question on Periodic Solutions of Nonlinear Systems of Equations With a Small Parameter PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1960, Vol. 12, No. 4, pp. 391 - 401 The authors consider the system TEXT: $\frac{dx}{dt} = X(x) + \varepsilon Y(t,x) ,$ (11) where $\ell>0$ is a small parameter; t is the time; x,X,Y are n-dimensional vectors of the Euclidean E , and the following conditions are satisfied: 1. Y(t,x) are continuous and 2π - periodic in t; 2. The equations (2) $\frac{\mathrm{d}\mathbf{x}}{\mathrm{d}t} = \mathbf{X}(\mathbf{x}) + \epsilon \overline{\mathbf{Y}}(\mathbf{x}) = \phi(\mathbf{x}) \quad ,$ where $\overline{Y}(x) = \frac{1}{2\pi} \int_{0}^{2\pi} Y(t,x)dt$, have an isolated statical solution $x^* = x_0^*$

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700009-6

Bikolai Mitrofanovich Erglov; on his 80th birthday. Ukr. mat.
shur. 12 no.2:205-208 '60.

1. Chlen-korrespondent AM USSR (for Mitropol'skiy).
(Erylov, Mikolai Mitrofanovich, 1879-)

P/006/65/505/002/001/55 A222/A026

Latest Achievements in the Field of Non-Linear Mechanics

(Ref. 10) and Ye. P. Popov (Ref. 20, 21) who employed the principles of non-linear mechanics in the theory of automation. At the close of the article the author points out that due to space limitation, the papers of many other significant authors have not been mentioned, e.g., L.S. Pontryagin, E.F. Mish chenko, A.N. Tikhonov, V.M. Volosov et al. There are 22 Soviet references.

ASSOCIATION: Institut Matematiki AN UkrSSR, Kiyev (Institute of Mathematics, Academy of Sciences UkrSSR, Kiyev)

SUBMITTED: December 23, 1959

Card 3/3

P/006/60/008/002/001/00? A222/A026 Latest Achievements in the Field of Non-Linear Mechanics who investigated unstable vibration in turbine rotors; B.I. Moseyenkov (Ref. 18) who evolved an "energetic" method and investigated transition processes in the vibration of shafts, bars, etc., with distributed parameters; VO. Kononenko (Ref. 8), Yu.O. Mitropol skiy and O.B. Likova (Ref. 15) who engaged in linear differential equations with slowly changing parameters approximated to linear systems with periodic coefficients and making possible research on accelerated systems; K.V. Zadiraka (Ref. 11) who investigated systems approximated to relaxation systems; N.N. Bogolyubov and D.N. Zubarev (Ref. 3) who extended the compensation principle in lon-linear mechanics: K.A. Breus (Ref. 4) who investigated differential equation systems with periodic coefficients, which may be used in the analysis of special gyroscope systems with high-speed revolving parts; A. M. Fedorchenko (Ref. 22) who introduced new variables in canonic equations describing a certain gyroscope system; G.S. Pisarenko (Ref. 19) and successors who employed the methods of non-linear mechanics in mechanic cal engineering and automatic control; V.O. Kononenko (Ref. 9) who solved a number of problems related to the influence of dry friction on vibration and the influence of relaxation oscillation on harmonic oscillation. A ! Lur'ye

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700009-6

Card 2/3

P/006/60/008/002/001/457 **A222/A**026

AUTHOR: Mitropo.

Mitropol'skiy, Yu. A.

Latest Achievements in the Field of Non-Linear Mechanics 1

PERIODICAL: Rozprawy Inzynierskie, 1960, Vol. 8, No. 2, pp. 123-135

The article presents a brief and general survey of results obtained during the last decade by the successors to N.N. Bogdyubov in the field of non-linear mechanics. The author gives a brief explanation of the concept of non-linear mechanics. The author gives a brief explanation of the concept of asymptotic evolvements referred to a non-linear vibrating system with slow of asymptotic evolvements referred to a non-linear vibrating system with slow method was used to solve a number of problems and explain phenomena such as method was used to solve a number of problems and explain phenomena such as a ransition through resonance in non-linear vibrating systems, vibrations in a variable-length pendulum, the effect of a modulated-frequency "sinusoidal" a variable-length pendulum, the effect of a modulated-frequency "sinusoidal" a variable-length pendulum, unstable processes in gyroscope systems, passence on a non-linear vibrator, unstable processes in gyroscope systems, passes through critical numbers in crankshafts, centrifuges, turbine rotors, etc. sage through critical numbers in crankshafts, centrifuges, turbine rotors, etc. Lately, the method was used by Veksler (Ref. 5) and associates to solve a number of problems in cyclotron calculation, aspecially to calculate the amplitudes of synchrotron oscillation excited by resonance and acoustic means. Used by the following authors: V.A. Grobov (Ref. 6) Brief mention is further made of the following authors:

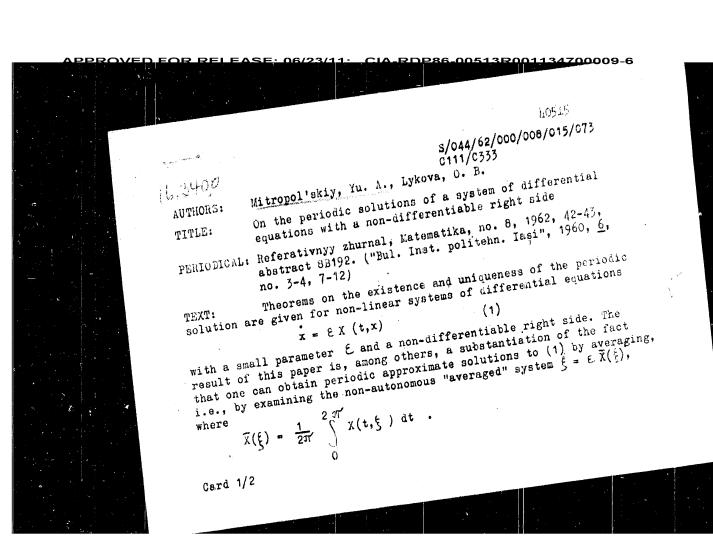
Card 1/3

S/C44/62/c00/008/615/C73

Cn the periodic solutions of a . . . C111/C333

Such a reduction method was already used by M. Urabe (Rzh. Mat., 1959, 3750), if the right side of (1) is integrable with respect to x. The existence of a periodic solution to (1) was proved with the help of the well known Schauder topological fix point theorem. In the uniquents of proof the authors also used the known principle of contracting mappings of Cacciopoli-sanach.

[Abstracter's note: Complete translation.]



FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700009-6

\$/021/60/000/001/001/013 A158/A029

AUTHORS:

Mitropol'skyy, Yu.O., Corresponding Member of the AS UkrSSR, Lykova, O.B.

TITLE:

On Periodic Solutions of Non-Automatic Systems in the Case of an

Isolated Originating Solution

PERIODICAL:

Dopovidi Akademiyi nauk Ukrains'koyi Radyanskoyi Sotsialistychnoyi

Respubliky, 1960, No. 1, pp. 3 - 6

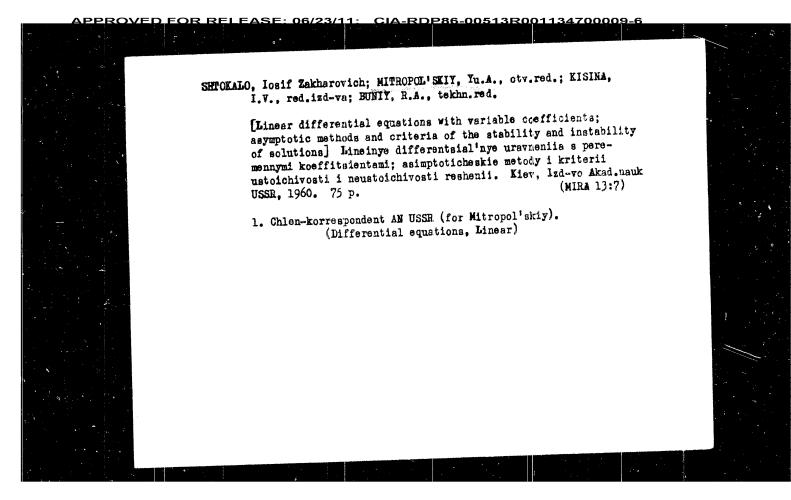
TEXT: The authors deal with an allegedly existing periodical solution of a system of nonlinear differential equations closely relating to autonomous equations when the right-hand additives corresponding to the perturbing forces are not differentiated. The paper is an amplification of the first author's work (Ref. 1). No conclusions are drawn and no practically applicable formulas are offered. There are 2 Soviet references.

ASSOCIATION: Instytut matematyky AN UkrSSR (Institute of Mathematics of the AS UkrSSR)

SUBMITTED:

July 1, 1959

Card 1/1



66401 Periodical Solutions of Simultaneous Non-Linear SOV/20-128-6-5/63 Differential Equations Having Non-Differentiable Right-Hand Members (5) $|X(t,x)| \leq M$ $|X(t,x') - X(t,x'')| \le \gamma |x' - x''|$ where $x, x', x'' \in U_g$, $-\infty < t < \infty$, M > 0, n > 0 are constants. It is shown that under these assumptions (1) has a periodic solution x = x(t) in a certain neighborhood of x = x(t). If besides (28) $|X(t,x') - X(t,x'')| < |\varphi(t)| |x' - x''|$, where $\frac{1}{2\pi} \int_{0}^{\pi} |\varphi(t)| dt < \Re$, \Re - sufficiently small, and if x = x(t) is asymptotically stable, then the mentioned periodic solution of (1) is determined uniquely in the neighborhood of x = x(t). The author mentions V.V.Kozakevich. The author mentions V.V.Kozakevich. There is 1 Soviet reference. ASSOCIATION: Institut matematiki Akademii nauk USSR (Institute of Mathematics AS Ukr.SSR) PRESENTED: June 22, 1959, by N.N.Bogolyubov, Academician SUBMITTED: June 12, 1959 Card 2/2

6 66401 16,3400 SOV/20-128-6-5/6/3 16(1) - 🗗 Mitropol'skiy, Yu.A. AUTHOR: Periodical Solutions of Simultaneous Non-Linear Differential Equations Having Non-Differentiable Right-Hand Members TITLE: PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 6, pp 1118-1121 (USSR) (1) $\frac{dx}{dt} = \xi X(t,x);$ $x,X \in E_n, t - time, \xi > 0 - small parameter. Let A) X(t+2E,x)=X(t,x)$ Given the system ABSTRACT: B) the functions etions $\overline{X}(\xi) = \frac{1}{2\pi C} \int_{-\infty}^{\infty} X(t, \xi) dt$ (3) have bounded derivatives up to the third order with respect to ξ . Let among the solutions $\xi = \xi(t)$ of

(2) $\frac{d\xi}{dt} = E \overline{X}(\xi)$ exist one isolated statical solution $\xi = \xi_0$ for which $\overline{X}(\xi_0) = 0$, $\|\frac{\partial X}{\partial \xi}\|_{\xi = \xi_0} \neq 0$; C) in a convex neighborhood $U \in E_n$ of the solutions $\xi = \xi(t)$ we have Card 1/2

Nikolay Nikolayevich Bogolyubov.

(On the Occasion of His Pittieth Birthday)

He published about 200 scientific papers and 15 monographs, the most important of which are listed in chronological order.

Bogolyubov was awarded the Prize imeni M. V. Lomoneovo, two Stalin Prizes, and one Lenin Prize (1958). There are 1 figure and 62 references, 60 of which are Soviet.

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001134700009-6

Nikolay Bikolayevich Bogolyubov. (On the Occasion of His Fiftieth Birthday) sov/53-69-1-9/11

recent times he paid particular attention to the quantum theory. Besides, he was interested in pedagogical and scientific organization. Since 1936 he held a chair, first at Kiyev, but later at Moskovskiy gosudarstvennyy universitet (Moscow State University), from 1946-49 he was Dean at the mechanicalmathematical department of Kiyev State University imeni T. G. Shevchenko. Bogolyubov further supervised the work of a number of departments of the AS UkrSSR, recently the Otdel teoreticheskoy fiziki Matematicheskogo instituta im. V. A. Steklova AN SSSR (Department of Theoretical Physics of the Mathematics Institute imeni V. A. Steklov of the AS USSR). He is director of the Laboratoriya teoreticheskoy fiziki Ob"yedinennogo instituta yadernykh issledovaniy (Laboratory for Theoretical Physics of the Joint Institute of Nuclear Research). Under his supervision about 50 dissertations of persons aspiring for the degrees of Candidate or Doctor were defended. He founded schools for nonlinear mechanics (Kiyev) and theoretical physics (Moscow, Dubna, Kiyev).

Card 3/4

Nikólay Nikolayevich Bogolyubov. (On the Occasion of His Fiftieth Birthday) 507/53-69-1-9/11

Later, he occupied himself with the theory of nonlinear oscillations and developed approximation methods in the field of nonlinear mechanics; he then passed on the asymptotic methods in statistical mechanics and statistical physics, and published, among others, a number of papers in the field of statistical physics of classical systems. He developed a method of distribution functions and of generating functionals for the solution of the main problem of statistical physics - the calculation of thermodynamic functions by means of the molecular characteristics of the substance, in which connection he developed a theory of non-perfect gases. By means of the mathematical apparatus of distribution functions he further dealt with the nonequilibrium processes as well as with problems of quantum systems; he developed a method of approximative second quantization in order to remove the difficulties arising in connection with the symmetry of the density matrix. He further dealt with the theory of the degeneration of nonperfect gases and made the first step towards developing a microscopical theory of the superfluidaty of He II. Further work was devoted to problems of supraconductivity, and in

Card 2/4

PPROVED FOR RELEASE: 06/23/11: 24(d) AUTHORS: Mitropol'skiy, Yu. A., Tyablikov, S. V. SOY/53-69-1-9/11 TITLE: Nikolay Nikolayevich Bogolyubov (Nikolay Nikolayevich Bogolyubov) (On the Occasion of His Fiftieth Birthday) (k pyatidesyatiletiyu so dnya rozhdeniya) Uspekhi fizicheskikh nauk, 1959, Vol 69, Nr 1, pp 159-164 (USSR) PERIODICAL: ABSTRACT: On August 21, 1959 the well-known Soviet theoretical physicist N. N. Bogolyubov celebrated his 50th birthday. He was born at Gor'kiy, worked at the seminar of N. M. Krylov already in 1923, and wrote his first scientific paper in 1924; in 1925 he was Aspirant at the Chair for Mathematical Physics of the AS USSR, and defended his dissertation in 1928. Two years later he was awarded the title of Doctor h. c.; in 1939 he became Corresponding Member, AS UkrSSR, in 1947 he was appointed Corresponding Member AS USSR, in 1948 Real Member AS UkrSSR, and in 1953 he became Real Member AS USSR. He began his scientific career as a mathematician and published a number of papers (calculus of variations, theory of periodic functions, differential equations) together with his teacher N. M. Krylov. Card 1/4

On Periodic Solutions of Systems of Nonlinear SOV/41-11-4-5/15 Differential Equations With Non-Differentiable Right Parts $(33) \quad \frac{d \, \delta \xi}{d \, t} = \xi \widetilde{X} \, (\xi_0) \cdot \delta \, \xi;$ let its solution be

δξ = Dh ,

where D is a constant quadratic matrix and h is a linear combination of polynomials and exponential functions with n constants of integration. Then the term h appearing in the theorem, is defined by

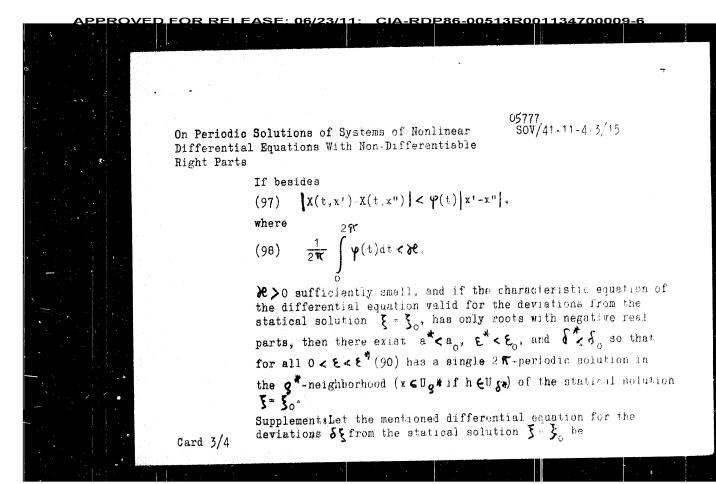
The author mentions B.V.Bulgakov, I.G.Malkin, Krylow, Bogolyubov, N.A.Ayzerman, F.R.Gantmakher, and V.Ye.Germandze.

There are 8 references, 7 of which are Somes, and 3 German.

SUBMITTED: June 19, 1959

(34)

Card 4/4



05777 On Periodic Solutions of Systems of Nonlinear SOV/41-11-4-3/15 Differential Equations With Non-Differentiable Right Parts $\underline{x} (\underline{\xi}^{\circ}) = 0$, $\|\underline{\partial}\underline{x}(\underline{\xi})\|^{\xi = \xi^{\circ}} \neq 0$ (93) Let there exist a convex neighborhood $\mathbf{U}_{\mathbf{g}}$ ($\mathbf{U}_{\mathbf{g}}$ \mathbf{C} $\mathbf{E}_{\mathbf{n}}$) of the solution $\S = \S(t)$ in which (94) $|X(t,x)| \leq M$ $|X(t,x')-X(t,x'')| \leq \eta |x'-x''|$ holds for $x_0x_1^{i}, x^{ii} \in \mathbb{U}_{\mathbf{S}}$ and all real t, where M and η are constants. Then for every arbitrarily small $\boldsymbol{\delta}$ there exist $\boldsymbol{\xi}_0$, $\boldsymbol{\delta}_0$, \boldsymbol{a}_0 . so that in the ς heighborhood of the statical solution $\xi = \xi_0$ of (91) ($g < g_0$, $x \in U_{g_0}$ if $h \in U_{g_0}$) the system (90) has a 2π -periodic solution x(t) for which |x(t)= 30 | 6 6. (96)Card 2/4

05777 16(1) SOV/41-11-4-3/15 AUTHOR: Mitropol skiy, Yu.A. (Kiyev) On Periodic Solutions of Systems of Nonlinear Differential TITLE: Equations With Non-Differentiable Right Parts PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1959, Vol 11, Nr 4.pp 366-379 (USSR) Theorem: Given the system ABSTRACT: (90) $\frac{dx}{dt} = \xi X(t,x)$,

where x,X are points of the E_n, t is the time, $\xi > 0$ is a small parameter. a) Let X(t,x) be continuous $X(t+2\pi c,x) = X(t,x)$ b) Let (91) $\frac{d\xi}{dt} = \xi \overline{X}(\xi)$, where $\overline{X}(\xi) = \frac{1}{2\pi} \int_{0}^{2\pi} X(t, \xi) dt$ (92)have the properties: 1. $\overline{X}(\S)$ have bounded partial derivatives with respect to \S up to the third order inclusively. 2. Among the solutions $\S = \S(t)$ of (91) there exists one isolated statical solution $\S = \S_0$ for which Card 1/4

7

16(1) AUTHORS:

BOV/41-11-3-8/16 Mitropol'skiy, Yu. A., and Tyablikov, S. V.

TITLE:

Nikolay Nikolayevich Bogolyubov (on the Occasion of his 50th

Birthday)

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1959, Vol 11, Nr 3,

pp 295-311 (USSR)

ABSTRACT

The authors give some biographical data and a survey on the most essential scientific results of Bogolyubov: He was born on August . 21, 1909 in Gorikiy. Since 1923 he was in the seminar of the Academician N.M. Krylov; in 1924 he published his first paper; in 1928 he published his dissertation; in 1930 he became Dr.math.h.c., in 1939 he became a corresponding member of the AS Ukr.SSR, and in 1953 Academician of the AS USSR. Begolyubov has two Stalin prizes, a Lenin prize, two Lenin orders, four further distinctions, and the Merlani prize (Bologna).

There is a photo of Bogolyubov and a list of his 179 publications

with translations in other languages.

Card 1/1

66645 SOV/21-59-11-1/27 On Periodic Solutions of Nonlinear Systems of Differential Equations That Come Close to the Autonomous Ones approximation of the periodic solution of system (1) is given in the form: $x1(t)=x_0^t+Dh_1(t)+\epsilon u(t,x_0^t+Dh_1(t),(22))$ where $h_{k}\left(t\right)$ is the periodic solution of the system of equations $\frac{dh_1}{dt} = Hh_1 + \epsilon D^{-1}X'x(x_0^*)u't, x_0^*).$ (23)The unique, stable and periodic solution of system (1) is formulated: $x(t) = x_0^* + Dh(t) + \mathcal{E}u(t, x_0^* + Dh(t)).$ There are 4 references, 1 of which is French, 1 Soviet, 1 Italian and 1 German. ASSOCIATION: Instytut matematyky AN URSR (Institute of Mathematics, AS UkrSSR) SUBMITTED: July 1, 1959 Card 3/3

RDP86-00513R001134700009

66645

16(- 14.3400

SOV/21-59-11-1/27

AUTHORS:

Mitropol's'ky, Yu.A., Corresponding Member, AS UkrSSR,

and Lykova, O.B.

TITLE:

On Periodic Solutions of Nonlinear Systems of Differential Equations That Come Close to the Autonomous Ones

PERIODICAL:

Dopovidi Akademiyi nauk Ukrayins'koyi RSR, 1959, Nr 11,

pp 1175-1178 (USSR)

ABSTRACT:

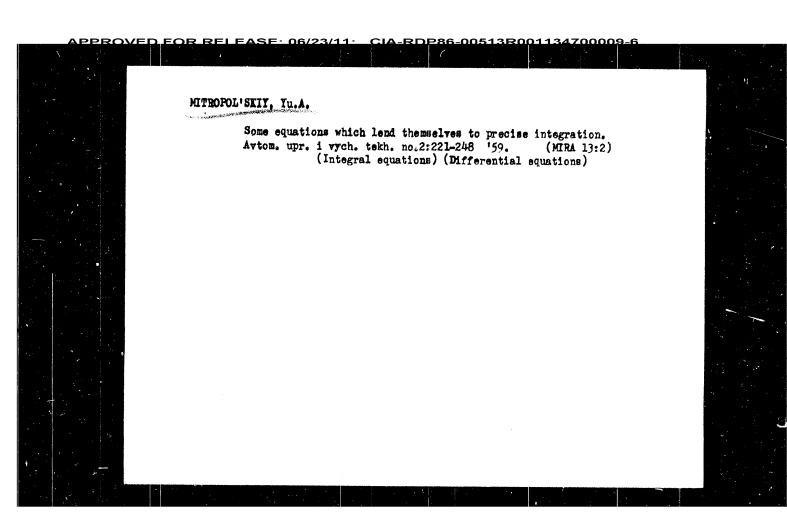
Examining a system of nonlinear differential equations $\frac{dx}{dt} = X(x) + \xi Y(t,x),$

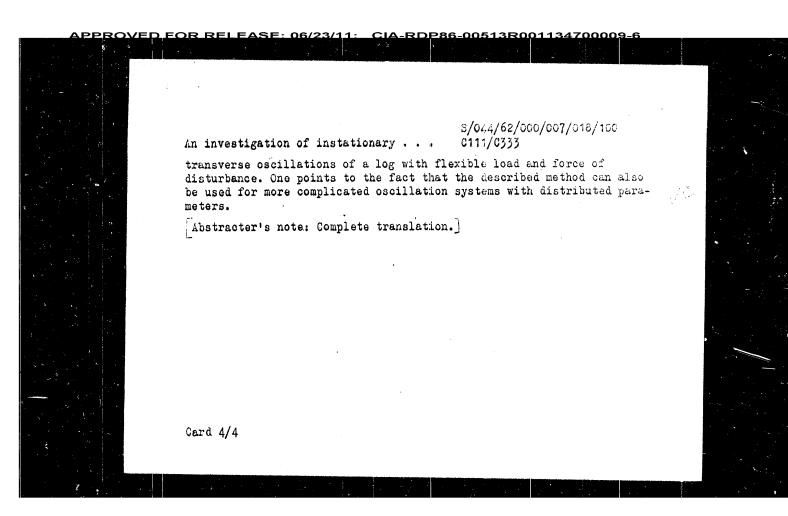
where x, X and Y are n-dimensional vectors of Euclidean space E_n , E is a small additional parameter and t is time, the authors prove the existence, uniqueness and stability of the periodic solution for that system and give an estimation of the difference between that solution and its first approximation. They assume that functions Y(t,x) are periodic in t with a period of

 2π , that a system of equations $\frac{dx}{dt} = X(x) + \xi Y(x) =$

Card 1/3

 $= \Phi(x),$





5/044/62/000/007/018/100 C111/C333

An investigation of instationary . . .

$$\frac{d\psi}{dt} = \omega - \frac{s}{r} v + \frac{2\epsilon}{m_1 a} \sum_{\sigma=\infty}^{\infty} \frac{(r\omega_1 - sv) \sigma_1 \frac{\delta \overline{W}_{\sigma}}{\delta \psi} \frac{1}{a} - 2\omega_1 \frac{\delta \overline{W}_{\sigma}}{\delta a}}{4\omega_1^2 - (r\omega_1 - sv)^2 \sigma^2},$$

where

$$\overline{\delta W} = \sum_{\sigma = -\infty}^{\infty} \overline{\delta W}_{\sigma} = \sum_{\sigma = -\infty}^{\infty} \left\{ \frac{\overline{\delta W}_{\sigma}}{\delta a} \, \delta a + \frac{\overline{\delta W}_{\sigma}}{\delta \psi} \, \delta \psi \right\},$$

where ∂W_{σ} is the virtual energy averaged on the oscillation cycle of the σ -th term of the Fourier expansion of the force of disturbance. Analogously one can construct the equations of the second approximation. Considered is the case where there are only potential forces present. The application of the method on systems with distributed parameters is shown by the following examples: transverse oscillations of a bar of the length 1, at the end of which there works an axial force; Card 3/4

expression is expanded into a Fourier series. In this expansion the authors introduce the symbolic denotations $\frac{\partial W}{\partial a}$ and $\frac{\partial W}{\partial b}$ for the coefficients at the variations \hat{U} a and $\frac{\partial W}{\partial b}$ and obtain for the determination of $A_1(T,a,Y)$, $B_1(T,a,Y)$ the system

$$\left(\omega_{1} - \frac{s}{r\sqrt{\partial\psi}} \frac{\partial A}{\partial\psi} - 2\omega_{1}aB_{1} - \frac{2}{m_{1}}\frac{\partial W}{\partial a},\right.$$

$$\left(\omega_{1} - \frac{s}{r}\sqrt{\partial\psi} + 2\omega_{1}A_{1} - \frac{a}{m_{1}}\frac{d(m_{1}\omega_{1})}{d\tau} + \frac{2}{m_{1}a}\frac{\partial W}{\partial\psi}.\right)$$

The equations of the first approximation are

$$\frac{da}{dt} = -\frac{\epsilon a}{2m_1\omega_1} \frac{d(m_1\omega_1)}{d\tau} + \frac{2\epsilon}{m_1} \sum_{d=\infty-\infty}^{\infty} \frac{(r\omega_1 - sv) \sigma_t}{4\omega_1^2 - (r\omega_1 - sv)^2 \sigma^2} \frac{\delta \overline{W}_{\sigma}}{d\tau} + 2\omega_1 \frac{\delta \overline{W}_{\sigma}}{\delta \phi} \frac{1}{a}.$$

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AUTHORS:

Mitropol's'kiy, Yu. O., Mosyeyenkov, B. I.

TITLE:

An investigation of instationary oscillating processes in

systems with distributed parameters

PERIODICAL:

Referativnyy zhurnal, Matematika, no. 7, 1962, 37-38, abstract 7B183. ("Visnyk Kyivs'k. un-tu", 1959, no. 2,

ser. astron., matem. ta mekhan., no. 1, 3-17)

By aid of the energetic method of Yu. A. Mitropol'skiy one investigates one-frequence processes in a number of concrete mechanical systems with distributed parameters. First of all the method itself is described: Instead of setting up strict equations one starts from the expressions for kinetic and potential energy and the generalised forces and sets up approximative equations for the determination of the phase and the amplitude of the oscillations. In order to obtain the equations of the first approximation one calculates the mean virtual energy which the forces of disturbance at a sine-shaped process would have carried out during a complete oscillation cycle on the virtual displacements which correspond to the variations of the amplitude and the phase. The obtained

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On the Stability of a One-Parametric Family of SOV/41-10-4-4/11 Solutions of a System of Equations With Variable Coefficients

phase space, the functions $X(\pi,x) + \epsilon X^*(\pi,\delta,x,\epsilon)$ $(\nabla - \epsilon t, \frac{d\theta}{dt} \cdot V(x))$ are 2π -periodic in θ , bounded, and sufficiently often differentiable with respect to x,t,ϵ . Then there exist $e^* < q$, $\mathcal{L}^* < \xi$, so that for all positive $\xi < \xi^*$ it holds: (1) has a unique one-parametric family of solutions $x(\xi,\eta,\delta,\psi)$ with the property that every solution x(t) of (1) with time becomes "attracted" by this family, i.e. $-\chi(t-t_0)$ $|x(\xi,t,\theta,\psi)-x(t)| \leq Ce$, where C and δ are positive constants.

There are 3 Soviet references.

16(1) 507/41-10-4-4/11 Mitropol'skiy, Yu.A. AUTHOR: On the Stability of a One-Parametric Family of Solutions of a System of Equations With Variable Coefficients (Ob ustoychivosti TITLE: odnoparametricheskogo semeystva resheniy sistemy uravneniy s peremennymi koeffitsiyentami) PERIODICAL: Ukrainskiy matematicheskiy zhurnal, 1958, Vol 10, Nr 4, pp 389-393 (USSR) Let the system of equations ABSTRACT: (1) $\frac{dx}{dt} = X(\mathcal{L}_{,x}) + \mathcal{E}X*(\mathcal{L}_{,\theta},x,\mathcal{E})$ satisfy the following conditions: 1) for the undisturbed system (2) $\frac{dx}{dt} = X(\mathcal{D},x)$, $\mathcal{D}=$ const for all $\mathcal{C}(-\infty < \mathcal{C} < \infty)$ there exists a family of stable periodic solutions (3) $x=x^{0}(\tau,\omega t+\varphi);$ $x^{0}(\tau,\psi)=x^{0}(\tau,\psi+2\pi), \psi=\omega t+\varphi;$ 2) there exist g and ξ_0 so that in the domain $-\infty < t < \infty$, $x \in D_g$, $0 < \xi < \xi_o$, where D_g is a g-neihborhood of (3) in the Card 1/2